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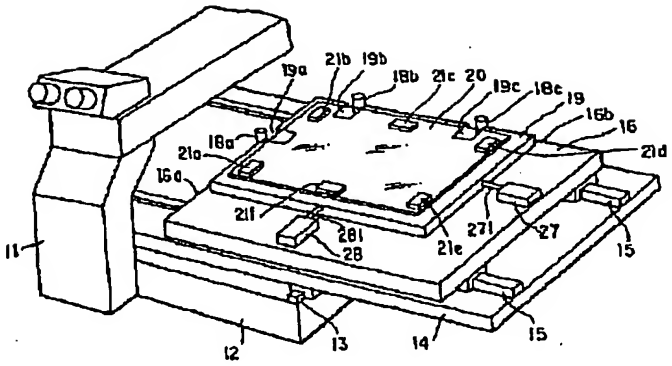
TITLE : POSITIONING AND HOLDING DEVICE FOR SUBSTRATE MEMBER



ABSTRACT : PURPOSE: To provide a substrate member positioning and holding device capable of positioning and holding a substrate member by smoothly moving the substrate member to the reference position on an observation stage.

CONSTITUTION: While a holding stage 19 on which a glass substrate 20 is placed and fixed by means of suction pads 21a to 21f is moved toward reference pins 18a to 18c on the X stage 16 by energization of pressing cylinders 27, 28, the side edges of the glass substrate 10 are directly pressed to these reference pins 18a to 18c, by which the glass substrate is positioned. The fixing cylinder of a holding stage fixing section is energized from this positioning state, by which the holding stage 19 is fixed to the X stage 16.

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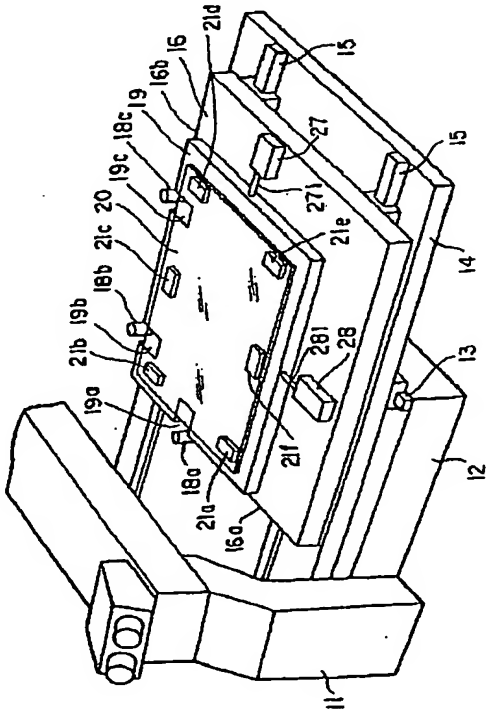
(54)【発明の名称】　基板部材の位置決め保持装置

(57)【要約】

【目的】本発明は、基板部材を観察ステージ上の基準位置にスムーズに移動して位置決め保持できる基板部材位置決め保持装置を提供する。

【構成】ガラス基板２０を吸着パット２１ａ～２１ｆを介して載置固定する保持ステージ１９を、押付けシリンダ２７、２８の付勢によりＸステージ１６上の基準ピン１８ａ、１８ｂ、１８ｃ方向に移動させながら、これら基準ピン１８ａ、１８ｂ、１８ｃにガラス基板２０の側縁を直接押し当てることで位置決めを行い、この位置決め状態から保持ステージ固定部２６の固定シリンダ２６３を付勢して保持ステージ１９をＸステージ１６に固定する。



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【特許請求の範囲】

【請求項１】　基板部材を観察する顕微鏡の観察ステージに設けられる基板部材の位置決め保持装置において、

前記観察ステージ上の位置基準を表す基準部材と、

前記観察ステージ上に移動可能に設けられ且つ前記基板部材が載置固定される保持ステージと、

この保持ステージを前記基準部材に対して移動させるとともに該基準部材により前記基板部材の位置決めを行う保持ステージ移動手段と、

前記保持ステージによる前記基板部材の位置決めにより該保持ステージを前記観察ステージに固定するステージ固定手段とを具備したことを特徴とする基板部材の位置決め保持装置。

【請求項２】　保持ステージ移動手段は、前記基板部材が載置固定された保持ステージを押圧して前記基準部材方向に移動させる押圧部材を具備したことを特徴とする請求項１記載の基板部材の位置決め保持装置。

【請求項３】　ステージ固定手段は、前記観察ステージを貫通した支持桿に支持された支持台と、該支持台上に設けられ前記観察ステージ面に所定の押圧力を作用させ前記保持ステージを前記観察ステージ面に固定させる押圧部材とを具備したことを特徴とする請求項１記載の基板部材の位置決め保持装置。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、液晶（ＬＣＤ）ガラス基板などの薄板状の基板部材を顕微鏡の観察ステージ上に位置決め保持する基板部材の位置決め保持装置に関する。

【０００２】

【従来の技術】従来、例えば、ＬＣＤの製造工程で取り扱われるＬＣＤガラス基板などの薄板状の基板部材の品質を観察するのに用いられる顕微鏡では、観察すべきガラス基板を、ロボットなどの搬送手段または作業者による手作業により顕微鏡の観察ステージ上に載置するようにしているが、この時、ガラス基板を位置基準となる固定ピンに押し当てて常に同じ基準位置に移動させ、この後、ガラス基板を真空吸着により固定することで、観察ステージ上に位置決め保持するようにしている。

【０００３】図４は、このような基板位置決め保持装置の一例を示すもので、この場合、顕微鏡の観察ステージ１上のガラス基板２が位置決め保持される基板保持面１ａの２つの側縁に沿って基準ピン２ａ、２ｂ、２ｃを配設するとともに、基板保持面１ａの四隅部分に吸着パット３ａ、３ｂ、３ｃ、３ｄを配設し、さらに基準ピン２ａを設けた側縁に対向してシリンダ４により移動可能にした押し付けピン５と基準ピン２ｂ、２ｃを設けた側縁に対向してシリンダ６により移動可能にした押し付けピン７を設けていて、まず、ガラス基板２を基板保持面１ａ上の基準ピン２ａ、２ｂ、２ｃよりわずかに離れた位置に載置し、この状態からシリンダ４を付勢して押し付けピン５によりガラス基板２を基準ピン２ａに押し付けるとともに、シリンダ６を付勢して押し付けピン７によりガラス基板２を基準ピン２ｂ、２ｃに押し付け、基板保持面１ａ上で位置決めされたところで、吸着パット３ａ、３ｂ、３ｃ、３ｄを負圧にして、ガラス基板２を観察ステージ１上に位置決め保持するようにしている。

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【０００４】

【発明が解決しようとする課題】ところが、このような基板位置決め保持装置では、ガラス基板２を位置決めするのに、ガラス基板２が吸着パット３ａ～３ｄ上を滑らせることで基準位置まで移動させるようにしているが、これら吸着パット３ａ～、３ｄは、その上表面を負圧が漏れないような高精度の平面に構成しており、しかも最近の液晶製造工程での洗浄能力の向上によりガラス面に不純物がほとんど存在しないことから、吸着パット３ａ～３ｄ上を滑らされるガラス基板２は、あえて負圧をかけなくとも吸着パット３ａ～３ｄに吸着されてしまう。

【０００５】このため基準位置まで吸着パット３ａ～３ｄ上に沿ってガラス基板２を滑らせるには、強力な力が必要となるが、ガラス基板２は、その厚さが１mm前後であるため、大きな力が加わることにより、亀裂が生じたり、破損してしまうことがある。また、吸着パット３ａ～３ｄ上を潤滑剤などを用いない状態で、ガラス基板２を移動させるため、吸着パットが磨耗して、その粉がガラス基板２下面に付着したり、この粉によりガラス基板２面に傷を付けてしまうおそれもあった。

【０００６】本発明は、上記事情に鑑みてなされたもので、ガラス基板を観察ステージ上の基準位置にスムーズに移動して位置決め保持できる基板位置決め保持装置を提供することを目的とする。

【０００７】

【課題を解決するための手段】請求項１記載の発明は、基板部材を観察する顕微鏡の観察ステージに設けられる基板部材の位置決め保持装置において、前記観察ステージ上の位置基準を表す基準部材と、前記観察ステージ上に移動可能に設けられ且つ前記基板部材が載置固定される保持ステージと、この保持ステージを前記基準部材に対して移動させるとともに該基準部材により前記基板部材の位置決めを行う保持ステージ移動手段と、前記保持ステージによる前記基板部材の位置決めにより該保持ステージを前記観察ステージに固定するステージ固定手段とにより構成されている。

【０００８】請求項２記載の発明では、請求項１記載において、保持ステージ移動手段は、前記基板部材が載置固定された保持ステージを押圧して前記基準部材方向に移動させる押圧部材を具備している。

【０００９】請求項３記載の発明では、請求項１記載において、ステージ固定手段は、前記観察ステージを貫通した支持桿に支持された支持台と、該支持台上に設けら

れ前記観察ステージ面に所定の押圧力を作用させ前記保持ステージを前記観察ステージ面に固定させる押圧部材とを具備している。

【００１０】

【作用】この結果、請求項１乃至３記載の発明によれば、基板部材を載置固定する保持ステージを、保持ステージ移動手段により観察ステージ上の位置基準を表す基準部材方向に移動させながら該基準部材により基板部材の位置決めを行い、この位置決め状態からステージ固定手段により保持ステージを観察ステージに固定するようにしている。これにより、基板部材に過大な力を与えることなく移動させることで位置基準部材に対する位置決めを行うことができ、さらにこの位置決め状態から保持ステージを観察ステージに固定することで、基板部材の位置決め状態を保持できるようになる。

【００１１】

【実施例】以下、本発明の一実施例を図面に従い説明する。図１は同実施例の概略構成を示すもので、図において、１１は薄板状基板部材としてのＬＣＤガラス基板の品質を観察するのに用いられる顕微鏡本体で、この顕微鏡本体１１は、基板観察のための図示しない光学系を搭載している。

【００１２】また、この顕微鏡本体１１は、水平なベース１２を有していて、このベース１２のＹ軸方向に沿ってガイド１３が設けられ、このガイド１３に沿って移動可能にＹステージ１４を設けている。このＹステージ１４は、図示しないモータによりＹ軸方向の移動量が制御されるようになっている。また、Ｙステージ１４には、Ｘ軸方向に沿ってガイド１５が設けられ、このガイド１５に沿って移動可能にＸステージ１６を設けている。このＸステージ１６も図示しないモータによりＸ軸方向の移動量が制御されるようになっている。

【００１３】Ｘステージ１６は、２つの側縁１６ａ、１６ｂに沿って位置基準を表す基準ピン１８ａ、１８ｂ、１８ｃを設けるとともに、これら基準ピン１８ａ、１８ｂ、１８ｃにより位置決めされるガラス基板２０を載置する保持ステージ１９を搭載している。

【００１４】保持ステージ１９は、観察されるガラス基板２０を載置して固定するもので、該保持ステージ１９上面の四隅部分および長手方向側縁の中間部にそれぞれ吸着パット２１ａ～２１ｆを設けている。これら吸着パット２１ａ～２１ｆは、載置されたガラス基板２０を吸着して固定するためのものである。また、保持ステージ１９は、基準ピン１８ａ、１８ｂ、１８ｃに対向する側縁部に切欠き部１９ａ、１９ｂ、１９ｃを形成している。これら切欠き部１９ａ、１９ｂ、１９ｃは、基準ピン１８ａ、１８ｂ、１８ｃの直径より大きな開口部寸法を有するとともに、これら開口部に保持ステージ１９に載置されたガラス基板２０の基準ピン１８ａ、１８ｂ、１８ｃに押し当てられる側縁部を位置させるようにしている。

【００１５】また、保持ステージ１９は、Ｘステージ１６に対向する裏面に、図２に示すようなボールキャスタ２２を埋設している。この場合、これらボールキャスタ２２は、保持ステージ１９の重心を囲む位置に３箇所以上設けるようにする。

【００１６】これらボールキャスタ２２は、図２に示すように保持ステージ１９裏面に形成した孔部１９ｄに圧縮コイルバネ２３を介してキャスタ本体２４を設けたものである。そして、この場合、圧縮コイルバネ２３の偏倚力を保持ステージ１９の重量による荷重を上回るものにして、常時、キャスタ本体２４を孔部１９ｄ開口端のストッパ２５に押し付けることにより、保持ステージ１９をＸステージ１６上面から持上げ、該Ｘステージ１６面に沿って小さな力量で移動できるようにしている。

【００１７】また、保持ステージ１９の裏面側には、図３に示すようなＸステージ１６に対させて保持ステージ固定部２６を設けている。この固定部２６は、図３に示すようにＸステージ１６の透孔１６１を貫通する一対の支持桿２６１を設け、これら一対の支持桿２６１により支持されるシリンダ台２６２をＸステージ１６面と平行して設け、さらにこのシリンダ台２６２上に固定シリンダ２６３を設けている。

【００１８】この固定シリンダ２６３は、可動部２６４を上下動する機構を有し、可動部２６４の上昇によりＸステージ１６の下面をボールキャスタ２２の圧縮コイルバネ２３の偏倚力を上回る力量で押し付け、保持ステージ１９をＸステージ１６上面に固定するようにしている。

【００１９】なお、固定部２６の一対の支持桿２６１が貫通されるＸステージ１６の透孔１６１は、保持ステージ１９が所定の範囲で移動するのに支障ない程度の大きさに形成している。

【００２０】そして、保持ステージ１９の基準ピン１８ａを設けた側縁に対向して押付けシリンダ２７を設けるとともに、基準ピン１８ｂ、１８ｃを設けた側縁に対向して押付けシリンダ２８を設け、これら押付けシリンダ２７、２８の可動部２７１、２８１により保持ステージ１９端を押圧することで、該保持ステージ１９を各基準ピン１８ａ、１８ｂ、１８ｃ方向に移動するようにしている。

【００２１】次に、このように構成した実施例の動作を説明する。いま、ガラス基板２０が保持ステージ１９上に載置されていない場合は、押付けシリンダ２７、２８の可動部２７１、２８１による保持ステージ１９の押圧がなく、また、保持ステージ固定部２６の可動部２６４による押付けもないので、保持ステージ１９は、各基準ピン１８ａ、１８ｂ、１８ｃから離れた位置でボールキャスタ２２によりＸステージ１６上を支持桿２６１が貫通されるＸステージ１６の透孔１６１の範囲で移動可能

な状態にある。

【００２２】この状態から、保持ステージ１９の吸着パット２１ａ～２１ｆ上にロボットなどの搬送手段または作業者による手作業によりガラス基板２０を載置する。この場合、ガラス基板２０を載置する位置は、基準ピン１８ａ、１８ｂ、１８ｃより離れていれば、これら基準ピン１８ａ、１８ｂ、１８ｃに対して多少斜めになっていてもよい。そして、吸着パット２１ａ～２１ｆを負圧にしてガラス基板２０を保持ステージ１９上に吸着固定する。

【００２３】次に、押付けシリンダ２７、２８を付勢してそれぞれの可動部２７１、２８１により保持ステージ１９を基準ピン１８ａおよび基準ピン１８ｂ、１８ｃの方向に押圧する。これにより、保持ステージ１９は、各基準ピン１８ａ、１８ｂ、１８ｃ方向に移動する。この場合、保持ステージ１９上に載置されたガラス基板２０側縁が、保持ステージ１９の切欠き部１９ａ、１９ｂ、１９ｃの開口部に位置されるので、これら切欠き部１９ａ、１９ｂ、１９ｃ開口部に位置するガラス基板２０側縁部が、直接基準ピン１８ａ、１８ｂ、１８ｃに押し当てられることで、保持ステージ１９の位置決めが行われる。この位置決め動作では、保持ステージ１９は、ボールキャスタ２２により移動自在になっているので、押付けシリンダ２７、２８による力量は小さなもので十分である。

【００２４】そして、ガラス基板２０側縁部が直接基準ピン１８ａ、１８ｂ、１８ｃに押し当てられ、保持ステージ１９の位置決めが完了した時点で、次に、保持ステージ固定部２６の固定シリンダ２６３を付勢し可動部２６４によりＸステージ１６下面を押し上げる。この場合、固定シリンダ２６３によるＸステージ１６の押し上げ力は、ボールキャスタ２２の圧縮コイルバネ２３の偏倚力を上回るものなので、キャスタ本体２４は沈み込み、保持ステージ１９は、Ｘステージ１６に直接押し付け固定される。

【００２５】これにより、ガラス基板２０は、直接基準ピン１８ａ、１８ｂ、１８ｃに押し当てられ位置決めされた状態で、Ｘステージ１６上に固定されることになる。その後、Ｘステージ１６上で顕微鏡観察されたガラス基板２０を取り外すには、まず、保持ステージ固定部２６の固定シリンダ２６３の付勢を解いてＸステージ１６下面の押し上げ力を解除し、ボールキャスタ２２の圧縮コイルバネ２３によりキャスタ本体２４を介して保持ステージ１９をＸステージ１６より持ち上げ、さらに押付けシリンダ２７、２８の付勢を解いてＸステージ１６に対する基準ピン１８ａ、１８ｂ、１８ｃ方向の押圧力を解除することで、保持ステージ１９をＸステージ１６で移動可能な状態に戻し、さらに吸着パット２１ａ～２１ｆの負圧を大気解放することにより、ガラス基板２０を保持ステージ１９上から取り外しするようになる。

【００２６】従って、このようにすればガラス基板２０を吸着パット２１ａ～２１ｆを介して載置固定する保持ステージ１９を、押付けシリンダ２７、２８の付勢によりＸステージ１６上の基準ピン１８ａ、１８ｂ、１８ｃ方向に移動させながら、これら基準ピン１８ａ、１８ｂ、１８ｃにガラス基板２０の側縁を直接押し当てることで位置決めを行い、この位置決め状態から保持ステージ固定部２６の固定シリンダ２６３を付勢して保持ステージ１９をＸステージ１６に固定するようにしたので、ガラス基板２０に過大な力を与えることなく基準ピン１８ａ、１８ｂ、１８ｃ方向に移動させて、これら基準ピン１８ａ、１８ｂ、１８ｃに対する位置決めを行うことができるとともに、この位置決め状態を保持ステージ１９のＸステージ１９の固定により保持することができ、これにより、従来、ガラス基板の位置決めの際の移動で、大きな力がガラス基板に加わり、ガラス基板に亀裂が生じたり破損してしまうような不都合をすべて解消することができ、さらに、従来のようにガラス基板を吸着パット上を滑らせることもないので、吸着パットの磨耗粉がガラス基板面に付着したり、この磨耗粉によりガラス基板面に傷を付けるような不都合も解消することができる。

【００２７】また、この実施例では、保持ステージ１９がＸステージ１６上面に押し付けられるので、Ｘステージ１６の剛性が高く面精度がよければ、保持ステージ１９として薄く撓んだ素材のものを用いても、ガラス基板２０の吸着状態の平面性を確保できるので、その分部品コストの低減を得られる。また、ボールキャスタ２２は、保持ステージ１９のガラス基板２０の載置される面と反対側に配置されるので、保持ステージ１９の移動の際に発生する塵などがガラス基板２０面に付着するようなことも防止できる。

【００２８】なお、上述した実施例では、保持ステージ１９の移動機構や固定機構に機械部材を使用したが、例えば、Ｘステージ１６上にエア噴出／吸着部材を設け、保持ステージ１９の位置決め時は、このエアを噴出して保持ステージ１９を小さな力で移動可能とし、固定時には、逆に負圧にして吸着して固定するようにしてもよい。また、保持ステージ１９の移動手段として、エアシリンダの他に、カム、リンク機構、送りネジなどをモータで駆動するような構成を採用することもできる。また、保持ステージ１９上でのガラス基板２０の固定に空気を利用するも可能である。また、保持ステージ１９は、基準ピン１８ａ、１８ｂ、１８ｃに対向する側縁部に切欠き部１９ａ、１９ｂ、１９ｃを形成し、これら切欠き部１９ａ、１９ｂ、１９ｃの開口部に保持ステージ１９に載置されたガラス基板２０の基準ピン１８ａ、１８ｂ、１８ｃに押し当てられる側縁部を位置させるようにしたが、保持ステージ１９のガラス基板２０の載置面をガラス基板２０より小さく形成して、ガラス基板２０

の基準ピン１８ａ、１８ｂ、１８ｃに押し当てられる側縁部を設けるようにしてもよい。

【００２９】以上、実施例に基づいて説明したが、本発明中には以下の発明が含まれる。

（１）基板部材を観察する顕微鏡の観察ステージに設けられる基板部材の位置決め保持装置において、前記観察ステージ上の位置基準を表す基準部材と、前記観察ステージ上に移動可能に設けられ且つ前記基板部材が載置固定される保持ステージと、この保持ステージを前記基準部材に対して移動させるとともに該基準部材により前記基板部材の位置決めを行う保持ステージ移動手段と、前記保持ステージによる前記基板部材の位置決めにより該保持ステージを前記観察ステージに固定するステージ固定手段とを具備したことを特徴とする基板部材の位置決め保持装置。

【００３０】このようにすれば、基板部材に過大な力を与えることなく移動させることで位置基準部材に対する位置決めを行うことができ、さらにこの状態から保持ステージを観察ステージに固定することで基板部材の位置決め状態を保持できるので、基板部材に大きな力が加わり亀裂が生じたり破損してしまうようなことを防止でき、さらに基板部材を保持ステージ上の吸着パットなどの固定部材上を滑らせることもないので、固定部での磨耗粉が基板部材面に付着したり、磨耗粉により基板部材面に傷を付けるようなことを防止できる。

【００３１】（２）（１）記載の基板部材の位置決め保持装置において、保持ステージ移動手段は、前記基板部材が載置固定された保持ステージを押圧して前記基準部材方向に移動させる押圧部材を具備している。

【００３２】このようにすれば、保持ステージ上の基板部材の位置決めのための移動を簡単な構成で実現できる。

（３）（１）記載の基板部材の位置決め保持装置において、ステージ固定手段は、前記観察ステージを貫通した支持桿に支持された支持台と、該支持台上に設けられ前記観察ステージ面に所定の押圧力を作用させ前記保持ステージを前記観察ステージ面に固定させる押圧部材とを具備している。このようにすれば、位置決めされた基板部材を載置した保持ステージの観察ステージへの固定を簡単な構成により実現できる。

【００３３】

【発明の効果】以上述べたように、本発明によれば、基

板部材に過大な力を与えることなく移動させることで位置基準部材に対する位置決めを行うことができ、さらにこの状態から保持ステージを観察ステージに固定することで基板部材の位置決め状態を保持できるので、基板部材に大きな力が加わり亀裂が生じたり破損してしまうようなことを防止でき、さらに基板部材を保持ステージ上の吸着パットなどの固定部材上を滑らせることもないので、固定部の磨耗粉が基板部材面に付着したり、磨耗粉により基板部材面に傷を付けるようなことを防止できる。

【図面の簡単な説明】

【図１】本発明の一実施例の概略構成を示す図。

【図２】一実施例に用いられるボールキャスタの概略構成を示す図。

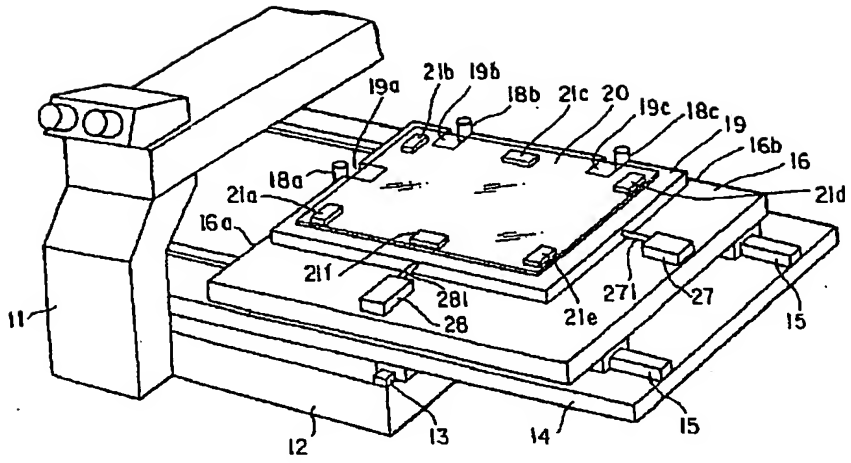
【図３】一実施例に用いられる保持ステージ固定部の概略構成を示す図。

【図４】従来の基板位置決め保持装置の一例を示す概略構成図。

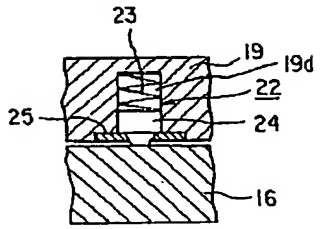
【符号の説明】

１１…顕微鏡本体、
１２…ベース、
１３…ガイド、
１４…Ｙステージ、
１５…ガイド、
１６…Ｘステージ、
１６ａ、１６ｂ…側縁、
１６１…透孔、
１８ａ、１８ｂ、１８ｃ…基準ピン、
１９…保持ステージ、
１９ａ、１９ｂ、１９ｃ…切欠き部、
１９ｄ…孔部、２０…ガラス基板、
２１ａ、２１ｂ、２１ｃ、２１ｄ、２１ｅ、２１ｆ…吸着パット、
２２…ボールキャスタ、
２３…圧縮コイルバネ、
２４…キャスタ本体、
２５…ストッパ、
２６…保持ステージ固定部、
２６１…支持桿、
２６２…シリンダ台、
２６３…固定シリンダ、
２６４…可動部。

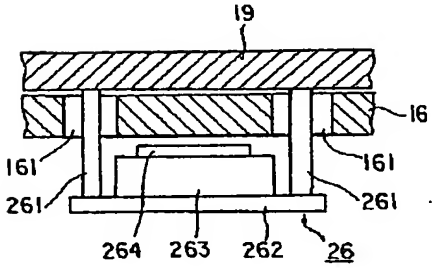
【図１】



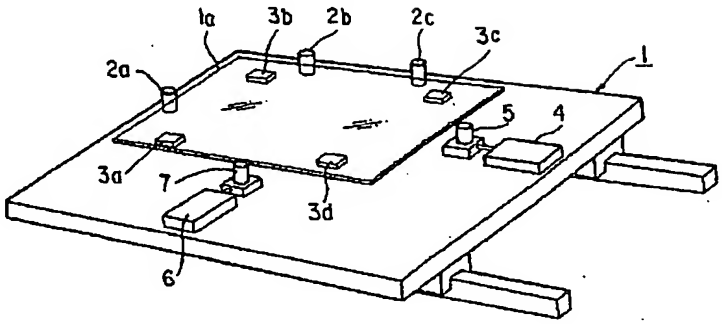
【図２】



【図３】



【図４】



* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] In the positioning supporting structure of the substrate member prepared in the observation stage of the microscope which observes a substrate member The maintenance stage where it is prepared movable the criteria member showing the datum reference on said observation stage, and on said observation stage, and installation immobilization of said substrate member is carried out, A maintenance stage migration means to position said substrate member by this criteria member while moving this maintenance stage to said criteria member, The positioning supporting structure of the substrate member characterized by providing a stage fixed means to fix this maintenance stage to said observation stage by positioning of said substrate member by said maintenance stage.
[Claim 2] A maintenance stage migration means is the positioning supporting structure of the substrate member according to claim 1 characterized by providing the press member which presses the maintenance stage where installation immobilization of said substrate member was carried out, and is moved in said direction of a criteria member.
[Claim 3] A stage fixed means is the positioning supporting structure of the substrate member according to claim 1 characterized by providing the susceptor supported by the support rod which penetrated said observation stage, and the press member which it is prepared [member] on this susceptor, makes predetermined thrust act on said observation stage side, and makes said maintenance stage fix to said observation stage side.

[Translation done.]

* NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the positioning supporting structure of the substrate member which carries out positioning maintenance of the substrate member of the shape of sheet metal, such as a liquid crystal (LCD) glass substrate, on the observation stage of a microscope.
[0002]
[Description of the Prior Art] Under the microscope used for observing the quality of the substrate member of the shape of sheet metal, such as a LCD glass substrate dealt with by the production process of the former, for example, LCD Although he is trying to lay the glass substrate which should be observed on the observation stage of a microscope by the handicraft by a conveyance means or operators, such as a robot At this time, press a glass substrate against the lock-pin used as a datum reference, and it is made to move to the always same criteria location, and is made to carry out positioning maintenance of the glass substrate on an observation stage by fixing by vacuum adsorption after this.
[0003] Drawing 4 is what shows an example of such the substrate positioning supporting structure. In this case While the glass substrate 2 on the observation stage 1 of a microscope arranges criteria pin 2a, 2b, and 2c along with two side edges of substrate maintenance side 1a by which positioning maintenance is carried out The adsorption putt 3a, 3b, 3c, and 3d is arranged in the four-corners part of substrate maintenance side 1a. The forcing pin 5 and criteria pin 2b which countered the side edge which furthermore prepared criteria pin 2a, and were made movable in the cylinder 4, The forcing pin 7 which countered the side edge which prepared 2c and was made movable in the cylinder 6 is formed. First, while laying a glass substrate 2 in criteria pin 2a on substrate maintenance side 1a, 2b, and the location distant more slightly than 2c, energizing and forcing a cylinder 4 from this condition and pushing a glass substrate 2 against criteria pin 2a by the pin 5 A cylinder 6 is energized and forced and a glass substrate 2 is pushed against criteria pin 2b and 2c by the pin 7, and the adsorption putt 3a, 3b, 3c, and 3d is made into negative pressure, and it is made to carry out positioning maintenance of the glass substrate 2 on the observation stage 1 in the place positioned on substrate maintenance side 1a.
[0004]
[Problem(s) to be Solved by the Invention] However, although he is trying to make it move to a criteria location at such the substrate positioning supporting structure because a glass substrate 2 lets an adsorption putt 3a-3d top slide although a glass substrate 2 is positioned These adsorption putt 3a-3d is constituted at a highly precise flat surface from which negative pressure does not leak the upper front face. And since an impurity hardly exists in a glass side by improvement in the washing capacity in the latest liquid crystal production process, the glass substrate 2 which lets an adsorption putt 3a-3d top slide will be adsorbed by the adsorption putt 3a-3d even if it does not dare apply negative pressure.
[0005] For this reason, in order to let a glass substrate 2 slide along an adsorption putt 3a-3d top to a criteria location, the powerful force is needed, but since that thickness is around 1mm, a crack may arise or a glass substrate 2 may be damaged, when the big force is added. Moreover, in the condition of not using an adsorption putt 3a-3d top for lubricant etc., in order to move a glass substrate 2, adsorption putt was worn out, that powder adhered to glass substrate 2 inferior surface of tongue, and there was also a possibility of attaching a blemish to the 2nd page of a glass substrate with this powder.
[0006] This invention was made in view of the above-mentioned situation, and aims at moving a glass substrate to the criteria location on an observation stage smoothly, and offering the substrate positioning supporting structure which can carry out positioning maintenance.
[0007]
[Means for Solving the Problem] In the positioning supporting structure of the substrate member prepared in the

observation stage of the microscope under which invention according to claim 1 observes a substrate member The maintenance stage where it is prepared movable the criteria member showing the datum reference on said observation stage, and on said observation stage, and installation immobilization of said substrate member is carried out, A maintenance stage migration means to position said substrate member by this criteria member while moving this maintenance stage to said criteria member, It is constituted by stage fixed means to fix this maintenance stage to said observation stage by positioning of said substrate member by said maintenance stage.

[0008] In invention according to claim 2, the maintenance stage migration means possesses the press member which presses the maintenance stage where installation immobilization of said substrate member was carried out, and is moved in said direction of a criteria member in claim 1 publication.

[0009] In invention according to claim 3, the stage fixed means possesses the susceptor supported by the support rod which penetrated said observation stage, and the press member which it is prepared [member] on this susceptor, makes predetermined thrust act on said observation stage side, and makes said maintenance stage fix to said observation stage side in claim 1 publication.

[0010]

[Function] Consequently, he positions a substrate member by this criteria member, moving the maintenance stage which carries out installation immobilization of the substrate member in the direction of a criteria member which expresses the datum reference on an observation stage with a maintenance stage migration means, and is trying to fix a maintenance stage to an observation stage with a stage fixed means from this positioning condition according to invention according to claim 1 to 3. Positioning to a datum reference member can be performed by making it move, without this giving the excessive force to a substrate member, and the positioning condition of a substrate member can be held now by fixing a maintenance stage to an observation stage from this positioning condition further.

[0011]

[Example] Hereafter, one example of this invention is explained according to a drawing. Drawing 1 shows the outline configuration of this example, in drawing, it is the body of a microscope used for 11 observing the quality of the LCD glass substrate as a sheet metal-like substrate member, and this body 11 of a microscope carries the optical system which is not illustrated for substrate observation.

[0012] Moreover, it has the level base 12, the guide 13 was formed in accordance with Y shaft orientations of this base 12, and this body 11 of a microscope has formed the Y stage 14 movable along with this guide 13. The movement magnitude of Y shaft orientations is controlled by the motor which does not illustrate this Y stage 14. Moreover, in accordance with X shaft orientations, the guide 15 was formed in the Y stage 14, and the X stage 16 is established in it movable along with this guide 15. The movement magnitude of X shaft orientations is controlled by the motor which does not illustrate this X stage 16, either.

[0013] The X stage 16 carries the maintenance stage 19 in which the glass substrate 20 positioned by these criteria pins 18a, 18b, and 18c is laid while forming the criteria pins 18a, 18b, and 18c which express a datum reference along with two side edges 16a and 16b.

[0014] The maintenance stage 19 lays the glass substrate 20 observed, is fixed, and has formed the adsorption putt 21a-21f in the pars intermedia of the four-corners part of this maintenance stage 19 top face, and a longitudinal direction side edge, respectively. These adsorption putt 21a-21f is for adsorbing the laid glass substrate 20 and fixing. Moreover, the maintenance stage 19 forms notches 19a, 19b, and 19c in the side edge section which counters the criteria pins 18a, 18b, and 18c. He is trying to locate the side edge section pressed against the criteria pins 18a, 18b, and 18c of the glass substrate 20 laid in the maintenance stage 19 by these openings while these notches 19a, 19b, and 19c have a bigger opening dimension than the diameter of the criteria pins 18a, 18b, and 18c.

[0015] Moreover, the maintenance stage 19 is laying the ball axle-pin rake 22 as shown in drawing 2 under the rear face which counters the X stage 16. In this case, these three or more ball axle-pin rakes 22 are formed in the location surrounding the center of gravity of the maintenance stage 19.

[0016] These ball axle-pin rake 22 forms the axle-pin-rake body 24 in 19d of pores formed in maintenance stage 19 rear face as shown in drawing 2 through a compression spring 23. And the maintenance stage 19 is raised from X stage 16 top face, and it enables it to move by small ability along the 16th page of this X stage by making it the thing exceeding the load according the biased force of a compression spring 23 to the weight of the maintenance stage 19 in this case, and always pushing the axle-pin-rake body 24 against the stopper 25 of 19d opening edge of pores.

[0017] Moreover, the X stage 16 as shown in drawing 3 R> 3 was made to receive, and the maintenance stage fixed part 26 is formed in the rear-face side of the maintenance stage 19. This fixed part 26 formed the support rod 261 of the pair which penetrates the bore 161 of the X stage 16, as shown in drawing 3 , it formed the cylinder base 262 supported by the support rod 261 of these pairs in parallel with the 16th page of X stage, and has formed the fixed cylinder 263 on

this cylinder base 262 further.
[0018] This fixed cylinder 263 has the device which moves moving part 264 up and down, and it forces the inferior surface of tongue of the X stage 16 by the ability exceeding the biased force of the compression spring 23 of the ball axle-pin rake 22, and he is trying to fix the maintenance stage 19 to X stage 16 top face by rise of moving part 264.
[0019] In addition, the maintenance stage 19 forms the bore 161 of the X stage 16 which the support rod 261 of the pair of a fixed part 26 penetrates in the magnitude of extent which is convenient although it moves in the predetermined range.
[0020] And while pushing against the side edge which prepared criteria pin 18a of the maintenance stage 19 face to face and forming a cylinder 27, it pushes against the side edge which formed the criteria pins 18b and 18c face to face, and he forms a cylinder 28, and is trying to move in each criteria pins 18a and 18b and the direction of 18c on this maintenance stage 19 by pressing maintenance stage 19 edge by the moving part 271 and 281 of these forcing cylinders 27 and 28.
[0021] Next, actuation of the example constituted in this way is explained. Now, when the glass substrate 20 is not laid on the maintenance stage 19 Since there is no press of the maintenance stage 19 by the moving part 271 and 281 of the forcing cylinders 27 and 28 and there is also no forcing by the moving part 264 of the maintenance stage fixed part 26 The maintenance stage 19 is in a movable condition in the range of the bore 161 of the X stage 16 where a support rod 261 penetrates the X stage 16 top by the ball axle-pin rake 22 in the location distant from each criteria pins 18a, 18b, and 18c.
[0022] From this condition, a glass substrate 20 is laid by the handicraft by a conveyance means or operators, such as a robot, on adsorption putt 21a-21f of the maintenance stage 19. In this case, as long as it has separated the location in which a glass substrate 20 is laid from the criteria pins 18a, 18b, and 18c, it may become aslant somewhat to these criteria pins 18a, 18b, and 18c. And the adsorption putt 21a-21f is made into negative pressure, and adsorption immobilization of the glass substrate 20 is carried out on the maintenance stage 19.
[0023] Next, the forcing cylinders 27 and 28 are energized and the maintenance stage 19 is pressed by each moving part 271 and 281 in the direction of criteria pin 18a and the criteria pins 18b and 18c. This moves in each criteria pins 18a and 18b and the direction of 18c on the maintenance stage 19. In this case, positioning of the maintenance stage 19 is performed by the glass substrate 20 side-edge section to which it is located in these notches 19a and 19b and 19c opening since glass substrate 20 side edge laid on the maintenance stage 19 is located in opening of the notches 19a, 19b, and 19c of the maintenance stage 19 being pressed against the direct criteria pins 18a, 18b, and 18c. Since migration of the maintenance stage 19 is attained by the ball axle-pin rake 22, the ability in the forcing cylinders 27 and 28 is small, and this positioning actuation is enough as it.
[0024] And when the glass substrate 20 side-edge section was pressed against the direct criteria pins 18a, 18b, and 18c and positioning of the maintenance stage 19 was completed next, the fixed cylinder 263 of the maintenance stage fixed part 26 is energized, and X stage 16 inferior surface of tongue is pushed up by moving part 264. In this case, since the X stage 16 in the fixed cylinder 263 pushes up and the force exceeds the biased force of the compression spring 23 of the ball axle-pin rake 22, the axle-pin-rake body 24 sinks and direct forcing immobilization of the maintenance stage 19 is carried out on the X stage 16.
[0025] By this, a glass substrate 20 is in the condition which was pressed against the direct criteria pins 18a, 18b, and 18c, and was positioned, and will be fixed on the X stage 16. Then, in order to remove the glass substrate 20 by which microscope observation was carried out on the X stage 16 First, solve energization of the fixed cylinder 263 of the maintenance stage fixed part 26, X stage 16 inferior surface of tongue pushes up, and the force is canceled. The maintenance stage 19 is raised from the X stage 16 through the axle-pin-rake body 24 by the compression spring 23 of the ball axle-pin rake 22. By pushing furthermore, solving energization of cylinders 27 and 28, and canceling the thrust of the criteria pins 18a and 18b and the direction of 18c to the X stage 16 It comes to remove a glass substrate 20 from on the maintenance stage 19 by returning the maintenance stage 19 to a movable condition on the X stage 16, and carrying out atmospheric-air release of the adsorption putt [21a-21f] negative pressure further.
[0026] Therefore, the maintenance stage 19 which will carry out installation immobilization of the glass substrate 20 through the adsorption putt 21a-21f if it does in this way Making it move in the criteria pins 18a and 18b on the X stage 16, and the direction of 18c by energization of the forcing cylinders 27 and 28 It positions by pressing the side edge of a glass substrate 20 against these criteria pins 18a, 18b, and 18c directly. Since the fixed cylinder 263 of the maintenance stage fixed part 26 is energized from this positioning condition and the maintenance stage 19 was fixed to the X stage 16 While being able to make it able to move in the criteria pins 18a and 18b and the direction of 18c and being able to perform positioning to these criteria pins 18a, 18b, and 18c, without giving the excessive force to a glass substrate 20 This positioning condition can be held by immobilization of the X stage 19 of the maintenance stage 19. By this by the

migration in the case of positioning of a glass substrate conventionally The big force can join a glass substrate and can cancel all un-arranging [that a crack produces in a glass substrate or it damages to it], and further, like before, since it does not let an adsorption putt top slide, a glass substrate The wear powder of adsorption putt can adhere to a glass substrate side, or it can also cancel un-arranging [which attaches a blemish to a glass substrate side with this wear powder].

[0027] Moreover, in this example, since the smoothness of the adsorbed state of a glass substrate 20 is securable even if it will use the thing of the material which bent thinly as a maintenance stage 19 if the rigidity of the X stage 16 is high and profile irregularity avoids since the maintenance stage 19 is forced on X stage 16 top face, reduction of that Wakebe article cost can be obtained. Moreover, since the ball axle-pin rake 22 is arranged in the field and the opposite side in which the glass substrate 20 of the maintenance stage 19 is laid, it can prevent it that the dust generated in the case of migration of the maintenance stage 19 adheres to the 20th page of a glass substrate.

[0028] In addition, although the machine member was used for the migration device and fixed device of the maintenance stage 19, this air is blown off and the maintenance stage 19 is made movable by the small force, and it is conversely made into negative pressure at the time of positioning of the maintenance stage 19, it sticks to it, and you may make it prepare air jet / adsorption member on the X stage 16, and fix it in the example mentioned above, at the time of immobilization, for example. Moreover, a configuration which drives a cam, a link mechanism, a delivery screw, etc. by the motor other than an air cylinder is also employable as a migration means of the maintenance stage 19. Moreover, ** which uses air for immobilization of the glass substrate 20 on the maintenance stage 19 is possible. The maintenance stage 19 in the side edge section which counters the criteria pins 18a, 18b, and 18c Moreover, notch 19a, Although it was made to locate the side edge section pressed against the criteria pins 18a, 18b, and 18c of the glass substrate 20 which formed 19b and 19c and was laid in the maintenance stage 19 by opening of these notches 19a, 19b, and 19c The installation side of the glass substrate 20 of the maintenance stage 19 is formed smaller than a glass substrate 20, and you may make it prepare the side edge section pressed against the criteria pins 18a, 18b, and 18c of a glass substrate 20.

[0029] As mentioned above, although explained based on the example, the following invention is included in this invention.

(1) In the positioning supporting structure of the substrate member prepared in the observation stage of the microscope which observes a substrate member The maintenance stage where it is prepared movable the criteria member showing the datum reference on said observation stage, and on said observation stage, and installation immobilization of said substrate member is carried out, A maintenance stage migration means to position said substrate member by this criteria member while moving this maintenance stage to said criteria member, The positioning supporting structure of the substrate member characterized by providing a stage fixed means to fix this maintenance stage to said observation stage by positioning of said substrate member by said maintenance stage.

[0030] Positioning to a datum reference member can be performed by making it move, if it does in this way, without giving the excessive force to a substrate member. Since the positioning condition of a substrate member can be held by furthermore fixing a maintenance stage to an observation stage from this condition The big force joins a substrate member, a crack can arise or can prevent what is damaged, and further, since it does not let a holddown-members top, such as adsorption putt on a maintenance stage, slide, a substrate member The wear powder in a fixed part can adhere to a substrate member side, or what attaches a blemish to a substrate member side with wear powder can be prevented.

[0031] (2) In the positioning supporting structure of a substrate member given in (1), the maintenance stage migration means possesses the press member which presses the maintenance stage where installation immobilization of said substrate member was carried out, and is moved in said direction of a criteria member.

[0032] If it does in this way, the migration for positioning of the substrate member on a maintenance stage is realizable with an easy configuration.

(3) In the positioning supporting structure of a substrate member given in (1), the stage fixed means possesses the susceptor supported by the support rod which penetrated said observation stage, and the press member which it is prepared [member] on this susceptor, makes predetermined thrust act on said observation stage side, and makes said maintenance stage fix to said observation stage side. If it does in this way, immobilization on the observation stage of the maintenance stage in which the positioned substrate member was laid is realizable with an easy configuration.

[0033]

[Effect of the Invention] As stated above, according to this invention, positioning to a datum reference member can be performed by making it move, without giving the excessive force to a substrate member. Since the positioning condition of a substrate member can be held by furthermore fixing a maintenance stage to an observation stage from this condition The big force joins a substrate member, a crack can arise or can prevent what is damaged, and further, since it does not

let a holddown-members top, such as adsorption putt on a maintenance stage, slide, a substrate member The wear powder of a fixed part can adhere to a substrate member side, or what attaches a blemish to a substrate member side with wear powder can be prevented.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] This invention relates to the positioning supporting structure of the substrate member which carries out positioning maintenance of the substrate member of the shape of sheet metal, such as a liquid crystal (LCD) glass substrate, on the observation stage of a microscope.

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PRIOR ART

[Description of the Prior Art] Under the microscope used for observing the quality of the substrate member of the shape of sheet metal, such as a LCD glass substrate dealt with by the production process of the former, for example, LCD Although he is trying to lay the glass substrate which should be observed on the observation stage of a microscope by the handicraft by a conveyance means or operators, such as a robot At this time, press a glass substrate against the lock-pin used as a datum reference, and it is made to move to the always same criteria location, and is made to carry out positioning maintenance of the glass substrate on an observation stage by fixing by vacuum adsorption after this.
[0003] Drawing 4 is what shows an example of such the substrate positioning supporting structure. In this case While the glass substrate 2 on the observation stage 1 of a microscope arranges criteria pin 2a, 2b, and 2c along with two side edges of substrate maintenance side 1a by which positioning maintenance is carried out The adsorption putt 3a, 3b, 3c, and 3d is arranged in the four-corners part of substrate maintenance side 1a. The forcing pin 5 and criteria pin 2b which countered the side edge which furthermore prepared criteria pin 2a, and were made movable in the cylinder 4, The forcing pin 7 which countered the side edge which prepared 2c and was made movable in the cylinder 6 is formed. First, while laying a glass substrate 2 in criteria pin 2a on substrate maintenance side 1a, 2b, and the location distant more slightly than 2c, energizing and forcing a cylinder 4 from this condition and pushing a glass substrate 2 against criteria pin 2a by the pin 5 A cylinder 6 is energized and forced and a glass substrate 2 is pushed against criteria pin 2b and 2c by the pin 7, and the adsorption putt 3a, 3b, 3c, and 3d is made into negative pressure, and it is made to carry out positioning maintenance of the glass substrate 2 on the observation stage 1 in the place positioned on substrate maintenance side 1a.

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EFFECT OF THE INVENTION

[Effect of the Invention] As stated above, according to this invention, positioning to a datum reference member can be performed by making it move, without giving the excessive force to a substrate member. Since the positioning condition of a substrate member can be held by furthermore fixing a maintenance stage to an observation stage from this condition The big force joins a substrate member, a crack can arise or can prevent what is damaged, and further, since it does not let a holddown-members top, such as adsorption putt on a maintenance stage, slide, a substrate member The wear powder of a fixed part can adhere to a substrate member side, or what attaches a blemish to a substrate member side with wear powder can be prevented.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, although he is trying to make it move to a criteria location at such the substrate positioning supporting structure because a glass substrate 2 lets an adsorption putt 3a-3d top slide although a glass substrate 2 is positioned These adsorption putt 3a-3d is constituted at a highly precise flat surface from which negative pressure does not leak the upper front face. And since an impurity hardly exists in a glass side by improvement in the washing capacity in the latest liquid crystal production process, the glass substrate 2 which lets an adsorption putt 3a-3d top slide will be adsorbed by the adsorption putt 3a-3d even if it does not dare apply negative pressure.
[0005] For this reason, in order to let a glass substrate 2 slide along an adsorption putt 3a-3d top to a criteria location, the powerful force is needed, but since that thickness is around 1mm, a crack may arise or a glass substrate 2 may be damaged, when the big force is added. Moreover, in the condition of not using an adsorption putt 3a-3d top for lubricant etc., in order to move a glass substrate 2, adsorption putt was worn out, that powder adhered to glass substrate 2 inferior surface of tongue, and there was also a possibility of attaching a blemish to the 2nd page of a glass substrate with this powder.
[0006] This invention was made in view of the above-mentioned situation, and aims at moving a glass substrate to the criteria location on an observation stage smoothly, and offering the substrate positioning supporting structure which can carry out positioning maintenance.

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MEANS

[Means for Solving the Problem] In the positioning supporting structure of the substrate member prepared in the observation stage of the microscope under which invention according to claim 1 observes a substrate member The maintenance stage where it is prepared movable the criteria member showing the datum reference on said observation stage, and on said observation stage, and installation immobilization of said substrate member is carried out, A maintenance stage migration means to position said substrate member by this criteria member while moving this maintenance stage to said criteria member, It is constituted by stage fixed means to fix this maintenance stage to said observation stage by positioning of said substrate member by said maintenance stage.
[0008] In invention according to claim 2, the maintenance stage migration means possesses the press member which presses the maintenance stage where installation immobilization of said substrate member was carried out, and is moved in said direction of a criteria member in claim 1 publication.
[0009] In invention according to claim 3, the stage fixed means possesses the susceptor supported by the support rod which penetrated said observation stage, and the press member which it is prepared [member] on this susceptor, makes predetermined thrust act on said observation stage side, and makes said maintenance stage fix to said observation stage side in claim 1 publication.

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OPERATION

[Function] Consequently, he positions a substrate member by this criteria member, moving the maintenance stage which carries out installation immobilization of the substrate member in the direction of a criteria member which expresses the datum reference on an observation stage with a maintenance stage migration means, and is trying to fix a maintenance stage to an observation stage with a stage fixed means from this positioning condition according to invention according to claim 1 to 3. Positioning to a datum reference member can be performed by making it move, without this giving the excessive force to a substrate member, and the positioning condition of a substrate member can be held now by fixing a maintenance stage to an observation stage from this positioning condition further.

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EXAMPLE

[Example] Hereafter, one example of this invention is explained according to a drawing. Drawing 1 shows the outline configuration of this example, in drawing, it is the body of a microscope used for 11 observing the quality of the LCD glass substrate as a sheet metal-like substrate member, and this body 11 of a microscope carries the optical system which is not illustrated for substrate observation.
[0012] Moreover, it has the level base 12, the guide 13 was formed in accordance with Y shaft orientations of this base 12, and this body 11 of a microscope has formed the Y stage 14 movable along with this guide 13. The movement magnitude of Y shaft orientations is controlled by the motor which does not illustrate this Y stage 14. Moreover, in accordance with X shaft orientations, the guide 15 was formed in the Y stage 14, and the X stage 16 is established in it movable along with this guide 15. The movement magnitude of X shaft orientations is controlled by the motor which does not illustrate this X stage 16, either.
[0013] The X stage 16 carries the maintenance stage 19 in which the glass substrate 20 positioned by these criteria pins 18a, 18b, and 18c is laid while forming the criteria pins 18a, 18b, and 18c which express a datum reference along with two side edges 16a and 16b.
[0014] The maintenance stage 19 lays the glass substrate 20 observed, is fixed, and has formed the adsorption putt 21a-21f in the pars intermedia of the four-corners part of this maintenance stage 19 top face, and a longitudinal direction side edge, respectively. These adsorption putt 21a-21f is for adsorbing the laid glass substrate 20 and fixing. Moreover, the maintenance stage 19 forms notches 19a, 19b, and 19c in the side edge section which counters the criteria pins 18a, 18b, and 18c. He is trying to locate the side edge section pressed against the criteria pins 18a, 18b, and 18c of the glass substrate 20 laid in the maintenance stage 19 by these openings while these notches 19a, 19b, and 19c have a bigger opening dimension than the diameter of the criteria pins 18a, 18b, and 18c.
[0015] Moreover, the maintenance stage 19 is laying the ball axle-pin rake 22 as shown in drawing 2 under the rear face which counters the X stage 16. In this case, these three or more ball axle-pin rakes 22 are formed in the location surrounding the center of gravity of the maintenance stage 19.
[0016] These ball axle-pin rake 22 forms the axle-pin-rake body 24 in 19d of pores formed in maintenance stage 19 rear face as shown in drawing 2 through a compression spring 23. And the maintenance stage 19 is raised from X stage 16 top face, and it enables it to move by small ability along the 16th page of this X stage by making it the thing exceeding the load according the biased force of a compression spring 23 to the weight of the maintenance stage 19 in this case, and always pushing the axle-pin-rake body 24 against the stopper 25 of 19d opening edge of pores.
[0017] Moreover, the X stage 16 as shown in drawing 3 R> 3 was made to receive, and the maintenance stage fixed part 26 is formed in the rear-face side of the maintenance stage 19. This fixed part 26 formed the support rod 261 of the pair which penetrates the bore 161 of the X stage 16, as shown in drawing 3 , it formed the cylinder base 262 supported by the support rod 261 of these pairs in parallel with the 16th page of X stage, and has formed the fixed cylinder 263 on this cylinder base 262 further.
[0018] This fixed cylinder 263 has the device which moves moving part 264 up and down, and it forces the inferior surface of tongue of the X stage 16 by the ability exceeding the biased force of the compression spring 23 of the ball axle-pin rake 22, and he is trying to fix the maintenance stage 19 to X stage 16 top face by rise of moving part 264.
[0019] In addition, the maintenance stage 19 forms the bore 161 of the X stage 16 which the support rod 261 of the pair of a fixed part 26 penetrates in the magnitude of extent which is convenient although it moves in the predetermined range.
[0020] And while pushing against the side edge which prepared criteria pin 18a of the maintenance stage 19 face to face and forming a cylinder 27, it pushes against the side edge which formed the criteria pins 18b and 18c face to face, and he forms a cylinder 28, and is trying to move in each criteria pins 18a and 18b and the direction of 18c on this

maintenance stage 19 by pressing maintenance stage 19 edge by the moving part 271 and 281 of these forcing cylinders 27 and 28.

[0021] Next, actuation of the example constituted in this way is explained. Now, when the glass substrate 20 is not laid on the maintenance stage 19 Since there is no press of the maintenance stage 19 by the moving part 271 and 281 of the forcing cylinders 27 and 28 and there is also no forcing by the moving part 264 of the maintenance stage fixed part 26 The maintenance stage 19 is in a movable condition in the range of the bore 161 of the X stage 16 where a support rod 261 penetrates the X stage 16 top by the ball axle-pin rake 22 in the location distant from each criteria pins 18a, 18b, and 18c.

[0022] From this condition, a glass substrate 20 is laid by the handicraft by a conveyance means or operators, such as a robot, on adsorption putt 21a-21f of the maintenance stage 19. In this case, as long as it has separated the location in which a glass substrate 20 is laid from the criteria pins 18a, 18b, and 18c, it may become aslant somewhat to these criteria pins 18a, 18b, and 18c. And the adsorption putt 21a-21f is made into negative pressure, and adsorption immobilization of the glass substrate 20 is carried out on the maintenance stage 19.

[0023] Next, the forcing cylinders 27 and 28 are energized and the maintenance stage 19 is pressed by each moving part 271 and 281 in the direction of criteria pin 18a and the criteria pins 18b and 18c. This moves in each criteria pins 18a and 18b and the direction of 18c on the maintenance stage 19. In this case, positioning of the maintenance stage 19 is performed by the glass substrate 20 side-edge section to which it is located in these notches 19a and 19b and 19c opening since glass substrate 20 side edge laid on the maintenance stage 19 is located in opening of the notches 19a, 19b, and 19c of the maintenance stage 19 being pressed against the direct criteria pins 18a, 18b, and 18c. Since migration of the maintenance stage 19 is attained by the ball axle-pin rake 22, the ability in the forcing cylinders 27 and 28 is small, and this positioning actuation is enough as it.

[0024] And when the glass substrate 20 side-edge section was pressed against the direct criteria pins 18a, 18b, and 18c and positioning of the maintenance stage 19 was completed next, the fixed cylinder 263 of the maintenance stage fixed part 26 is energized, and X stage 16 inferior surface of tongue is pushed up by moving part 264. In this case, since the X stage 16 in the fixed cylinder 263 pushes up and the force exceeds the biased force of the compression spring 23 of the ball axle-pin rake 22, the axle-pin-rake body 24 sinks and direct forcing immobilization of the maintenance stage 19 is carried out on the X stage 16.

[0025] By this, a glass substrate 20 is in the condition which was pressed against the direct criteria pins 18a, 18b, and 18c, and was positioned, and will be fixed on the X stage 16. Then, in order to remove the glass substrate 20 by which microscope observation was carried out on the X stage 16 First, solve energization of the fixed cylinder 263 of the maintenance stage fixed part 26, X stage 16 inferior surface of tongue pushes up, and the force is canceled. The maintenance stage 19 is raised from the X stage 16 through the axle-pin-rake body 24 by the compression spring 23 of the ball axle-pin rake 22. By pushing furthermore, solving energization of cylinders 27 and 28, and canceling the thrust of the criteria pins 18a and 18b and the direction of 18c to the X stage 16 It comes to remove a glass substrate 20 from on the maintenance stage 19 by returning the maintenance stage 19 to a movable condition on the X stage 16, and carrying out atmospheric-air release of the adsorption putt [21a-21f] negative pressure further.

[0026] Therefore, the maintenance stage 19 which will carry out installation immobilization of the glass substrate 20 through the adsorption putt 21a-21f if it does in this way Making it move in the criteria pins 18a and 18b on the X stage 16, and the direction of 18c by energization of the forcing cylinders 27 and 28 It positions by pressing the side edge of a glass substrate 20 against these criteria pins 18a, 18b, and 18c directly. Since the fixed cylinder 263 of the maintenance stage fixed part 26 is energized from this positioning condition and the maintenance stage 19 was fixed to the X stage 16 While being able to make it able to move in the criteria pins 18a and 18b and the direction of 18c and being able to perform positioning to these criteria pins 18a, 18b, and 18c, without giving the excessive force to a glass substrate 20 This positioning condition can be held by immobilization of the X stage 19 of the maintenance stage 19. By this by the migration in the case of positioning of a glass substrate conventionally The big force can join a glass substrate and can cancel all un-arranging [that a crack produces in a glass substrate or it damages to it], and further, like before, since it does not let an adsorption putt top slide, a glass substrate The wear powder of adsorption putt can adhere to a glass substrate side, or it can also cancel un-arranging [which attaches a blemish to a glass substrate side with this wear powder].

[0027] Moreover, in this example, since the smoothness of the adsorbed state of a glass substrate 20 is securable even if it will use the thing of the material which bent thinly as a maintenance stage 19 if the rigidity of the X stage 16 is high and profile irregularity avoids since the maintenance stage 19 is forced on X stage 16 top face, reduction of that Wakebe article cost can be obtained. Moreover, since the ball axle-pin rake 22 is arranged in the field and the opposite side in which the glass substrate 20 of the maintenance stage 19 is laid, it can prevent it that the dust generated in the case of

migration of the maintenance stage 19 adheres to the 20th page of a glass substrate.
[0028] In addition, although the machine member was used for the migration device and fixed device of the maintenance stage 19, this air is blown off and the maintenance stage 19 is made movable by the small force, and it is conversely made into negative pressure at the time of positioning of the maintenance stage 19, it sticks to it, and you may make it prepare air jet / adsorption member on the X stage 16, and fix it in the example mentioned above, at the time of immobilization, for example. Moreover, a configuration which drives a cam, a link mechanism, a delivery screw, etc. by the motor other than an air cylinder is also employable as a migration means of the maintenance stage 19. Moreover, ** which uses air for immobilization of the glass substrate 20 on the maintenance stage 19 is possible. The maintenance stage 19 in the side edge section which counters the criteria pins 18a, 18b, and 18c Moreover, notch 19a, Although it was made to locate the side edge section pressed against the criteria pins 18a, 18b, and 18c of the glass substrate 20 which formed 19b and 19c and was laid in the maintenance stage 19 by opening of these notches 19a, 19b, and 19c The installation side of the glass substrate 20 of the maintenance stage 19 is formed smaller than a glass substrate 20, and you may make it prepare the side edge section pressed against the criteria pins 18a, 18b, and 18c of a glass substrate 20.
[0029] As mentioned above, although explained based on the example, the following invention is included in this invention.
(1) In the positioning supporting structure of the substrate member prepared in the observation stage of the microscope which observes a substrate member The maintenance stage where it is prepared movable the criteria member showing the datum reference on said observation stage, and on said observation stage, and installation immobilization of said substrate member is carried out, A maintenance stage migration means to position said substrate member by this criteria member while moving this maintenance stage to said criteria member, The positioning supporting structure of the substrate member characterized by providing a stage fixed means to fix this maintenance stage to said observation stage by positioning of said substrate member by said maintenance stage.
[0030] Positioning to a datum reference member can be performed by making it move, if it does in this way, without giving the excessive force to a substrate member. Since the positioning condition of a substrate member can be held by furthermore fixing a maintenance stage to an observation stage from this condition The big force joins a substrate member, a crack can arise or can prevent what is damaged, and further, since it does not let a holddown-members top, such as adsorption putt on a maintenance stage, slide, a substrate member The wear powder in a fixed part can adhere to a substrate member side, or what attaches a blemish to a substrate member side with wear powder can be prevented.
[0031] (2) In the positioning supporting structure of a substrate member given in (1), the maintenance stage migration means possesses the press member which presses the maintenance stage where installation immobilization of said substrate member was carried out, and is moved in said direction of a criteria member.
[0032] If it does in this way, the migration for positioning of the substrate member on a maintenance stage is realizable with an easy configuration.
(3) In the positioning supporting structure of a substrate member given in (1), the stage fixed means possesses the susceptor supported by the support rod which penetrated said observation stage, and the press member which it is prepared [member] on this susceptor, makes predetermined thrust act on said observation stage side, and makes said maintenance stage fix to said observation stage side. If it does in this way, immobilization on the observation stage of the maintenance stage in which the positioned substrate member was laid is realizable with an easy configuration.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] Drawing showing the outline configuration of one example of this invention.
[Drawing 2] Drawing showing the outline configuration of the ball axle-pin rake used for one example.
[Drawing 3] Drawing showing the outline configuration of the maintenance stage fixed part used for one example.
[Drawing 4] The outline block diagram showing an example of the conventional substrate positioning supporting structure.
[Description of Notations]
11 -- Body of a microscope,
12 -- Base,
13 -- Guide,
14 -- Y stage,
15 -- Guide,
16 -- X stage,
16a, 16b -- Side edge,
161 -- Bore,
18a, 18b, 18c -- Criteria pin,
19 -- Maintenance stage,
19a, 19b, 19c -- Notch
19d -- A pore, 20 -- Glass substrate
21a, 21b, 21c, 21d, 21e, 21f -- Adsorption putt,
22 -- Ball axle-pin rake,
23 -- Compression spring
24 -- Axle-pin-rake body,
25 -- Stopper,
26 -- Maintenance stage fixed part,
261 -- Support rod,
262 -- Cylinder base,
263 -- Fixed cylinder,
264 -- Moving part.

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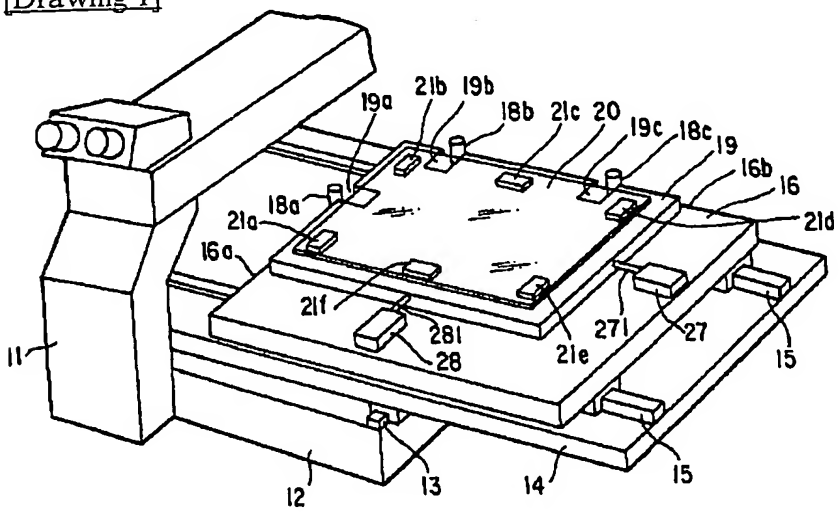
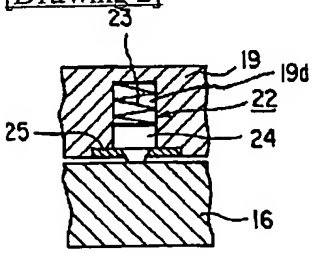
DRAWINGS

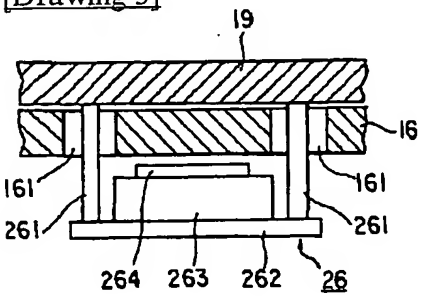
[Drawing 1]



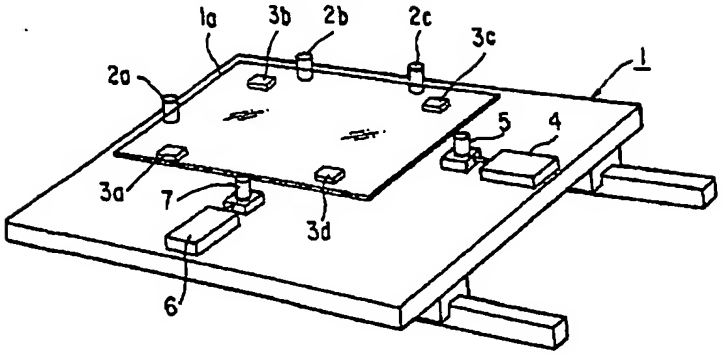
[Drawing 2]



[Drawing 3]



[Drawing 4]



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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CORRECTION OR AMENDMENT

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law
[Section partition] The 2nd partition of the 6th section
[Publication date] August 9, Heisei 14 (2002. 8.9)

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G02B 21/24
G01N 21/13
G02F 1/13 101
H01L 21/68
// H01L 21/66

[FI]

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G01N 21/13
G02F 1/13 101
H01L 21/68 G
21/66 J

[Procedure revision]
[Filing Date] May 21, Heisei 14 (2002. 5.21)
[Procedure amendment 1]
[Document to be Amended] Specification
[Item(s) to be Amended] Claim
[Method of Amendment] Modification
[Proposed Amendment]
[Claim(s)]
[Claim 1] The substrate maintenance stage which lays a substrate member and carries out adsorption maintenance, and the stage body which lays this substrate maintenance stage,
The axle-pin-rake means which is established between this stage body and said substrate installation stage, floats from said field of a stage body, and enables migration of this substrate maintenance stage along this side of a stage body,
The criteria member positioned in a criteria location by being placed in a fixed position on said stage body so that the side edge of said substrate member may be met, and pressing against said substrate maintenance stage the edge of the substrate member which carried out adsorption maintenance,
A substrate maintenance stage migration means for it to be arranged on both sides of said substrate member near the side edge of said substrate maintenance stage located in said criteria member and opposite side, and to move this substrate maintenance stage to said criteria member side,
The positioning supporting structure of the substrate member characterized by providing the fixed means which carries out the solid-state of said substrate maintenance stage to migration impossible to said stage body where the substrate

member by which adsorption maintenance of said substrate maintenance stage was carried out was forced on said each criteria member and positioned.
[Claim 2] Said axle-pin-rake means is the positioning supporting structure of the substrate member according to claim 1 characterized by preparing an at least three ball axle-pin rake in the rear face of said stage body and said substrate maintenance stage which counters centering on the center-of-gravity location of this substrate maintenance stage.
[Claim 3] Said axle-pin-rake means is the positioning supporting structure of the substrate member according to claim 1 characterized by constituting from an air jet means to blow off air between said stage body and said substrate maintenance stage, and to float this substrate maintenance stage from this stage body to it.
[Claim 4] Said air jet means is the positioning supporting structure of the substrate member according to claim 3 which makes it negative pressure and is characterized by operating this substrate maintenance stage as a fixed means which carries out adsorption immobilization on said field of a stage body in case said substrate maintenance stage is fixed to migration impossible.
[Claim 5] The support rod which said fixed means is fixed to the rear face of said substrate maintenance stage, and penetrates said stage body, It is arranged between the standing ways supported by this support rod, and these standing ways and said rear face of a stage body. It is the positioning supporting structure of a substrate member to the claim 1 publication characterized by consisting of press members which make predetermined thrust act on this rear face of a stage body, and make said substrate maintenance stage fix to said top face of a stage body through said support rod.
[Procedure amendment 2]
[Document to be Amended] Specification
[Item(s) to be Amended] 0001
[Method of Amendment] Modification
[Proposed Amendment]
[0001]
[Industrial Application] This invention relates to the positioning supporting structure which carries out positioning maintenance of the substrate member of the shape of sheet metal, such as a liquid crystal (LCD) glass substrate.
[Procedure amendment 3]
[Document to be Amended] Specification
[Item(s) to be Amended] 0007
[Method of Amendment] Modification
[Proposed Amendment]
[0007]
[Means for Solving the Problem] The substrate maintenance stage which the positioning supporting structure of this invention lays a substrate member, and carries out adsorption maintenance, It is prepared between the stage body which lays this substrate maintenance stage, and this stage body and said substrate installation stage. The axle-pin-rake means which floats from said field of a stage body, and enables migration of this substrate maintenance stage along this side of a stage body, The criteria member positioned in a criteria location by being placed in a fixed position on said stage body so that the side edge of said substrate member may be met, and pressing against said substrate maintenance stage the edge of the substrate member which carried out adsorption maintenance, A substrate maintenance stage migration means for it to be arranged on both sides of said substrate member near the side edge of said substrate maintenance stage located in said criteria member and opposite side, and to move this substrate maintenance stage to said criteria member side, the fixed means which carries out the solid-state of said substrate maintenance stage to migration impossible to said stage body where the substrate member by which adsorption maintenance of said substrate maintenance stage was carried out was forced on said each criteria member and positioned -- ** -- it is alike and is constituted more.
[Procedure amendment 4]
[Document to be Amended] Specification
[Item(s) to be Amended] 0008
[Method of Amendment] Deletion
[Procedure amendment 5]
[Document to be Amended] Specification
[Item(s) to be Amended] 0009
[Method of Amendment] Deletion
[Procedure amendment 6]
[Document to be Amended] Specification

[Item(s) to be Amended] 0010
[Method of Amendment] Deletion
[Procedure amendment 7]
[Document to be Amended] Specification
[Item(s) to be Amended] 0013
[Method of Amendment] Modification
[Proposed Amendment]
[0013] On the X stage 16, while the criteria pins 18a, 18b, and 18c which determine the criteria location to a glass substrate 20 along with two side edges 16a and 16b are formed, the maintenance stage 19 in which the glass substrate 20 positioned by these criteria pins 18a, 18b, and 18c is laid is carried.
[Procedure amendment 8]
[Document to be Amended] Specification
[Item(s) to be Amended] 0017
[Method of Amendment] Modification
[Proposed Amendment]
[0017] Moreover, the X stage 16 as shown in drawing 3 was made to counter, and the maintenance stage fixed part 26 is formed in the rear-face side of the maintenance stage 19. This fixed part 26 formed the support rod 261 of the pair which penetrates the bore 161 of the X stage 16, as shown in drawing 3, it formed the cylinder base 262 supported by the support rod 261 of these pairs in parallel with the 16th page of X stage, and has formed the fixed cylinder 263 on this cylinder base 262 further.
[Procedure amendment 9]
[Document to be Amended] Specification
[Item(s) to be Amended] 0029
[Method of Amendment] Deletion
[Procedure amendment 10]
[Document to be Amended] Specification
[Item(s) to be Amended] 0030
[Method of Amendment] Deletion
[Procedure amendment 11]
[Document to be Amended] Specification
[Item(s) to be Amended] 0031
[Method of Amendment] Deletion
[Procedure amendment 12]
[Document to be Amended] Specification
[Item(s) to be Amended] 0032
[Method of Amendment] Deletion

[Translation done.]